

SOLAR BASED SMART POULTRY MONITERING SYSTEM USING IOT

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Abstract - In contemporary world automation plays a vital role. This project focuses on an automation of poultry farm by using wireless sensor network and mobile communication system. Chicken is the most favourite produce in today's world because it is a nutrient rich food providing high protein, low fat and low cholesterol than other poultries. In this paper environmental parameters of a poultry farm such as temperature, humidity, and ammonia gas are monitored and controlled automatically in order to increase the growth of chicken. Water level also controlled and monitored with the help of sensor module. By connecting all the sensor modules to the microcontroller all sensor values are acquired then using Ethernet module it will be uploaded to the web page. The person in-charge of the poultry farm can get the internal environmental situation of poultry farm through PC. This system will control temperature, humidity, food level, ammonia gas and water level with the help of cooling fan, exhaust fan and DC motor without any human interface. Based on the threshold values it will switch on the devices. Thus this system design provides automated poultry, reduces man power and increases production of healthy chicken. So the overall power will provide from the solar energy.

KeyWords: Microcontroller, PoultryForm, Solar Based, Sensors, controller

1. INTRODUCTION

The Internet of Things (IoT) is an arrangement of interrelated computing gadgets, mechanical and digital machines, objects, animals or individuals that are given one kind of an identifiers and the capacity to exchange information over a system without requiring human-to-human or human-to-PC communication. IoT is a new concept that has evolved from the convergence of wireless technologies. Wireless communication is the transfer of information or signal between two or more points that are not connected by an electrical conductor. In IoT devices equipped with Wi-Fi allow the machine-to-machine communication.

Using this form of industrial machines to wearable or wireless devices, using built-in sensors to gather data and take action on that data across a network. The sensor and actuator can be setup in different place but they are working together over an internet network.

From the last few decades, around the globe, there has been an increased level of awareness regarding the food safety and there has been a high demand for better quality food. This has forced many countries to adopt new protocols to change all manual farms into automated farm. In this way

smart poultry farm has a great impact on increasing growth of chicken. This paper focused on modern technologies for a poultry farming to control all environmental parameters like temperature, humidity, ammonia gas which affects on the growth of the chickens. If the environmental condition is not up to the mark then there may be harmful for digestive, respiratory and behavioral change in the chickens. If chickens may get suitable atmosphere and proper water then it may grow rapidly and health of chickens will be good so the weight of the chickens will be increases.

In the growth of the chicken climate plays a vital role. Smart poultry farm is designed in such a way that the climate can be changed by cooling fan and exhaust fan. The parameters temperature, humidity, ammonia gas, food and water level are monitored and controlled with the help of Atmega 328 microcontroller. Web Page will design for Monitoring sensor values are and continuously it will uploaded on the webpage then the person in-charge can know the internal environment of poultry farm through mobile or personal computer.

2. OBJECTIVE

The objective of this project to design Smart Poultry System based on IOT & solar technology & to implement a web service for the Poultry farm owner.

3. METHODOLOGY

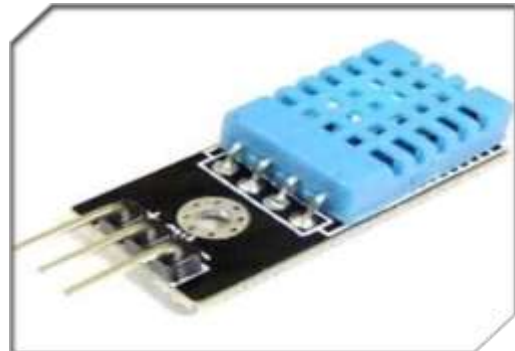
Atmega328 has been used as a controller With Ethernet module, temperature and Humidity sensor, which can monitor and observed the environmental temperature and humidity, sends the information to the microcontroller which can send the current data and perform action according to that. When temperature goes beyond threshold value then automatically cooling fan will be ON to control the internal temperature of poultry. The threshold value of temperature is 40.6 degree to 41.7 degree Celsius. Once, the temperature is below the threshold value cooling fan will automatically turn OFF. Similarly it can monitor and observed the environmental humidity and send the information to the microcontroller which can sense the data and perform action according to current value of humidity in a poultry farm. When humidity goes beyond threshold value then to control that humidity Exhaust fan will automatically ON. Once, internal humidity of poultry farm is under control then fan will automatically turn OFF.

MQ135 is used as a gas sensor. There are number of gases in air like, CH₄, NH₃ etc. Here focus on the ammonia gas (NH₃) in the air. Because, mainly ammonia gas is affected on the

- Range – 2 cm to 3 m (0.8 in to 3.3 yards)
- Input Trigger – positive TTL pulse, 2 us min, 5 μs
- Echo Pulse – positive TTL pulse, 115 us to 18.5 ms.
- Echo Hold-off – 750 μs from fall of Trigger pulse.
- Burst Frequency – 40 kHz for 200 μs.



- Good for 0-50°C temperature readings ±2°C accuracy
- No more than 1 Hz sampling rate (once every second)
- Body size 15.5mm x 12mm x 5.5mm
- 4 pins with 0.1" spacing



4.3 Gas sensor (mq 135)

- operating voltage 5v
- sensing resistance 30k ohm -200k ohm
- oxygen concentration-21%(standard condition) Oxygen
- concentration can affect sensitivity

4.4 Ethernet LAN

Arduino Ethernet Shield allows an Arduino board to connect to the internet. It is based on the Wiznet W5100 Ethernet chip (datasheet). The Wiznet W5100 provides a network (IP) stack capable of both TCP and UDP. It supports up to four simultaneous socket connections. Use the Ethernet library to write sketches which connect to the internet using the shield. The Ethernet shield 21 % (standard condition) Oxygen



Humidity sensor (dht11):

- The Ultra low cost
- 3 to 5V power and I/O
- 2.5mA max current use during conversion (while requesting data)
- Good for 20-80% humidity readings with 5% accuracy

4.6 LDR Sensor

- Can be used to sense Light
- Easy to use on Breadboard or Perf Board
- Easy to use with Microcontrollers or even with normal Digital/Analog IC
- Small, cheap and easily available
- Available in PG5 ,PG5-MP, PG12, PG12-MP, PG20 and PG20-MP



4.5 Water level sensor

A float switch is a type of level sensor, a device used to detect the level of liquid within a tank. The switch may be used to control a pump, as an indicator, an alarm, or to control other devices. One type of float switch uses a mercury switch inside a hinged float.



CONCLUSION

IOT is an innovative technology for poultry farming which can be changes a traditional farm into modern automated poultry farm. Various environmental parameters have been continuously monitored to improve health and growth of the chicken. Water control mechanism helps to provide time to time water supply to the chickens as well as help to avoid the wastage of water. Application of inter of things helps the farmer to monitor the internal environment of poultry farm. Hence owner can able to get all details of the poultry at anytime and anywhere Web based real time data visualization makes this system more convenient to see all the data in a clean

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